

March 2018

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Photo by Paul Selvaggio



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**MAN, LAND
and SEA
NEWSLETTER**
MARCH 2018

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Hafa Adai! Welcome to the March 2018 issue of Man, Land, and Sea, news of Guam and her coastal environment. In this issue, we present the efforts of our network partners and how they are working with the community to make Guam a great place to live, work, and play.

Guam's coral reefs are a precious natural resource – they create a vital habitat for marine life, support social activities and cultural practices,

provide the mainstay for Guam's tourism industry, and shelter our coastlines from storm damage and erosion. This year, we celebrate Guam Year of the Reef 2018 in honor of our coral reef ecosystems. Guam Year of the Reef 2018 launched with a proclamation signing by Lieutenant Governor Ray Tenorio and a presentation of a legislative resolution by Senator Louise B. Muña on February 2nd.

This issue emphasizes the importance of Guam's natural resources from ridge to reef. Our impacts on the land affect the health of our coastal waters. Guam's coral reefs are threatened by land-based sources of pollution including sedimentation, nutrient pollution, storm water runoff, and marine debris. Guam's reefs are also affected by overfishing and localized impacts such as vessel groundings and recreational misuse. Degraded coral reefs are less resilient and more likely to succumb to

the impacts of climate change, such as coral bleaching. With the ridge to reef approach, our partners are striving to conserve both terrestrial and marine ecosystems around Guam to ensure that our natural resources are intact for future generations.

In this issue, you will read about passive water sampling around Cocos Island, restoration in the Ugum Watershed, outreach conducted by UOG Sea Grant students, and a partnership between the Department of Agricultural and a local artist to conserve native birds.

We hope that these stories will encourage you to consider the value of Guam's natural resources to you and your family and take action to preserve our island from ridge to reef.

Si Yu'os Ma'ase,
Carl V. Dominguez
Director,
Bureau Statistics and Plans

Save the Date



March 13, 2018
8:00 a.m. – 5:00 p.m.
Holiday Resort Guam, Tumon
(Free Valet Parking)

Come to network and to learn how the Bureau of Statistics and Plans is working to advance comprehensive planning in order to upgrade the quality of life for Guam's people, protect our resources and provide for a vibrant economy.

- Plenaries includes talks on improving development impacts, as well as discussion on threats to water quality
- Training sessions include Geographic Information Systems, Land Use Planning, Federal Consistency, USACE Permitting Requirements for Stream Bank Stabilization, and several others

REGISTER FOR ASSEMBLY OF PLANNERS HERE or visit <https://form.jotform.co/temafnas/2018AP>
Please contact the Guam Coastal Management Program at 475-9668 for registration questions or email tina.mafnas@bsp.guam.gov. Registration is free but space is limited.

ASSEMBLY OF PLANNERS 2018

Paid for by federal funds through the Coastal Zone Management Act of 1972, as amended, Grant No. NA16NOS4190187

WATER QUALITY
EROSION
FLOODING
WATERSHED
NATURAL DISASTER
AWARENESS

DEVELOPMENT
CORALS
PERMITTING
HISTORIC
PRESERVATION

Bureau of Statistics and Plans new staff members



Gil S. Suguitan

Gil S. Suguitan is a Planner with the Guam Coastal Management Program. Gil will spearhead the on-going research, advocacy, and championing of Green Infrastructure (GI) and Low Impact Development technologies and its implementation.



Whitney Hoot

Whitney Hoot is the Coral Reef Resilience Coordinator within the Socioeconomic Planning Program. From January 2016-January 2018, she worked at BSP as the National Coral Reef Management Fellow. Her duties include coordinating the Guam Coral Reef Response Team and addressing impacts to coral reefs.



Mallory Morgan

Mallory Morgan is the National Coral Reef Management Fellow within the Bureau of Statistics and Plans Socioeconomic Planning Program. Over the next two years she will be focused on bridging the gap between the tourism industry and natural resource managers.

Target Audience: Include Mayors or staff and Municipal Planning Council members, Legislators and or staff, government employees involved in development, permitting, or natural resource management, private sector technical/professional staff, land use commissioners, utility planners.



Community members submitted photos of coral bleaching they spotted while in the water. Photo by John Gerlicher at Gab Gab while scuba diving



Piti youth spotted bleached staghorn corals while snorkeling in Piti Bomb Holes MPA

By Whitney Hoot
and Marybelle
Quinata

A Wake-up Call

Recent coral bleaching events mobilize the community to protect Guam's coral reefs

Guam's nearshore coral reefs are currently experiencing coral bleaching for the fourth time in five years. Coral bleaching, which is driven by ocean warming due to climate change, severely threatens the health of corals. Many species depend upon reefs, including fishes, invertebrates, and people too. Although the threat of climate change can be overwhelming, Guam's coral reef managers, scientists, community leaders, and concerned residents are dedicated to protecting Guam's reefs because they are vital for the welfare of Guam and our community in many ways. Guam's coral reefs protect coastal infrastructure from storms, create habitat to support our fisheries, and provide a place for tourism, recreation,

and traditional activities. Guam has some of the most biodiverse reefs found in the US states and territories; over 5,000 species can be found on and around our local reefs, including nearly 1,000 fish species and almost 400 species of reef-building stony corals.

When corals experience unusually warm water and hot, calm weather, corals become stressed and spit out the tiny marine plants

(algae) that live inside each coral polyp. Normally, these algae help corals by providing most of the energy they require to grow, reproduce, and build reefs. However, as the water temperatures increase, the algae become toxic to their coral hosts. Corals that have ejected their algae appear white and "bleached" because it is the algae that give healthy corals their vibrant colors. Bleached corals

can survive and recover from bleaching if conditions improve, but they are weak, hungry, and vulnerable without their algal partners. If temperatures remain elevated, many coral colonies will die. Corals grow very slowly; it takes decades or even centuries for the tiny coral polyps to build a reef. Because of this, the increasing frequency of coral bleaching events is a serious threat to coral reefs since the corals do not have time to recover and rebuild between events.

After about three months of extremely warm waters, Guam's coral reefs are now severely affected by coral bleaching, and many corals have died. Local coral reef managers and scientists, who work together as the Guam Coral Reef Response Team, are currently conducting surveys around the island to determine the extent and severity of this bleaching event.



Guam Year of the Reef 2018:

Bringing the community together to protect Guam's coral reefs for future generations



Attendees at the Guam Year of the Reef launch on February 2nd showed their commitment to coral reef protection by signing the Reef Pledge. (Whitney Hoot/BSP)



Students from JFK High School show off their artistic skills and their passion for coral reefs at the proclamation signing on February 2nd. (Whitney Hoot/BSP)

By Whitney Hoot,
Coral Reef
Resilience Coordinator,
whitney.hoot@bsp.guam.gov

Guam's coral reefs are a critical resource – they provide important habitat for fishes and other marine species; support social and cultural activities, including traditional fishing; form the backbone of Guam's growing tourism industry; and protect our coastlines from erosion and storms. According to the Atlas of Ocean Wealth produced by The Nature Conservancy, the value of Guam's reefs from tourism alone is over \$320,000 per year.

Despite their significance, our reefs are threatened by both local stressors – such as pollution, overfishing, and recreational misuse – and the impacts of global climate change and ocean acidification. This year, we recognize Guam Year of the Reef 2018 (GYOR) in honor of our valuable coral reef ecosystems and in answer to the global call to action to better protect and manage coral reefs.

The International Coral Reef Initiative has declared 2018 as the third International Year of the Reef. Local natural resource managers, scientists, and community leaders are working together to recognize this designation on Guam. Throughout



2018, Guam will host a series of public events and opportunities to get involved in coral reef conservation and improve the condition of local reefs. Events and activities will be centered on monthly themes: March is "Reefs and CHamoru culture," followed by "Guam's marine preserves" in April.

Guam Year of the Reef 2018 launched on February 2nd with a

proclamation signing by Lieutenant Governor Ray Tenorio. Senator Louise B. Muña presented legislative resolution No. 337-34 to recognize GYOR stakeholders; this resolution was introduced by Senators William M. Castro, Joe S. San Agustin, Fernando Barcinas Esteves, Therese M. Terlaje, Telena Cruz Nelson, Régine Biscoe Lee, Louise B. Muña, and Tommy Morrison. Held outside at the Ricardo J. Bordallo Governor's Complex in view of the Latte of Freedom and the reefs of East Agana Bay, the event was well attended, including over 100 participants from the Guardians of the Reef program representing Simon A. Sanchez High

School, John F. Kennedy High School, George Washington High School, and Southern High School. The "Guardians" are 11th and 12th grade students who are trained to teach 3rd graders about coral reef ecosystems. Students from JFK High School came toting reef-themed artwork, displaying their passion for Guam's coral reefs.

At the event, both students and adult participants declared their commitment to protecting coral reefs by signing the Reef Pledge and receiving GYOR Passports. At each GYOR event, participants will earn a passport stamp; at the end of the year, individuals with the most stamps will be eligible for reef-related prizes.

On February 10th, the Guam Community Coral Reef Monitoring Program (GCCRMP) held the second Reef Exploration, Experiences, and Fun (REEF) Celebration at the Hall of Governors at Adelup. Over 1,300 community members have participated in this program by completing classroom-based and in-water training to learn how to collect data and monitor the health of Guam's reef flat habitats. This event, which was supported by BSP and the National Oceanic and Atmospheric Administration (NOAA), featured GCCRMP's Adopt-a-Reef groups and showcased the efforts of local organizations such as the University of Guam's (UOG) Marine Lab, Micronesian Conservation Coalition, and Humatak Community Foundation.

GCCRMP coordinators Ms. Marybelle Quinata and Ms. Valerie Brown,

both with NOAA Fisheries, shared results of community-collected data and provided updates on the health of reef flat sites. During breaks, participants perused the Tano yan Tasi mini-fair and completed activities at booths staffed by partners including GCMP, the UOG Center for Island Sustainability and Sea Grant, and the Guam Community College Ecowarriors.

Presentations emphasized that although Guam's reefs have severely deteriorated, there is an important source of hope among the many dedicated citizens, natural resource managers, and community leaders who care deeply about Guam's coral reefs. Attendees nodded their heads when viewing slides showing degraded reefs, demonstrating their awareness of the dire situation, but clapped enthusiastically as groups and individuals were recognized for their tireless efforts to conserve coral reefs. Ms. Brown gave participants another reason to celebrate: GCCRMP is being renamed Friends of Reefs Guam (FOR Guam), as the program will be expanded to include activities outside of monitoring, such as coral reef restoration – another source of hope for Guam's reefs.



Piti Pete, the unicornfish (hangan), made a surprise appearance at the REEF Celebration on February 10th. (Patrick Keeler/BSP)



Mr. Carl Dominguez, Director of BSP, Lieutenant Governor Ray Tenorio, Senator Louise B. Muña, and Guardians of the Reef participants point out just one of the many "Guardians" present at the proclamation signing. (Whitney Hoot/BSP)

By Margaret Aguilar,
Tony Pait
and Renee Schnabel

Passive water sampling to inform restoration efforts

What is the size and shape of a license plate and will monitor the waters of Cocos Island for the presence of chemical contaminants? In September, a team of scientists deployed a series of passive water samplers known as PEDs, short for polyethylene devices, in the

waters and sand adjacent to Cocos Island. A fish consumption advisory has been in place in Cocos Lagoon since 2006 because of elevated levels of polychlorinated biphenyls (PCBs). More recently, the pesticide DDT has been found in local fish caught adjacent to Cocos Island.

The PEDs are small metal frames holding stretched polyethylene, a common plastic. Looking like a reinforced license plate frame, the devices were placed in the sand or water around Cocos Island, where chemical contaminants like PCBs and DDT, if present, will accumulate on the plastic.

After the PEDs are collected and analyzed, local resource managers will have better information on whether these chemicals are being transported in the water. This information will help inform future assessment and restoration efforts in the area of Cocos Island.



NOAA Scientist installing PEDs



GEPA biologist prep PED blanks



Prepping PED blanks using underwater drill



PEDs after 30-day sampling period. Partners in the project include NOAA's National Centers for Coastal Ocean Science, Guam EPA, DAWR, UOG Marine Lab, NOAA CRCP, NOAA Fisheries and USEPA.

Ugum Watershed: Restoration still a work in progress



Partners Mayor Doris Lujan, Forester Bel Solvia and Guam EPA Program Coordinator Margaret Aguilar continue to lead watershed restoration and public outreach efforts in the Ugum Watershed. Seventy percent of the land in the watershed is privately owned; therefore, coordination with landowners or their designated representatives is critical prior to implementing any best management prac-

tices. Other watershed partners include the Soil and Water Conservation Districts and USDA's Natural Resources Conservation Service (NRCS).

The Ugum River is impacted during heavy rain events by erosion and sedimentation. The river becomes very turbid (lots of sediment in the water) which affects the operation of the Ugum Water Treatment Plant (WTP). Residents in southern villages have water outages when high turbidity in the Ugum River forces a shutdown of the WTP.

One solution to reducing the erosion and sedimentation and improving river water quality is planting trees. The goal of the Ugum partner is to reforest public land acreage in the Bolanos Conservation Reserve. Another goal is to engage private landowners in available conservation programs to improve soil health on their property and improve water quality of the Ugum River.

Tree planting events forthcoming!

Join us! Adopt a native tree



Serenity Lions Club adopts Chalan Layon native trees

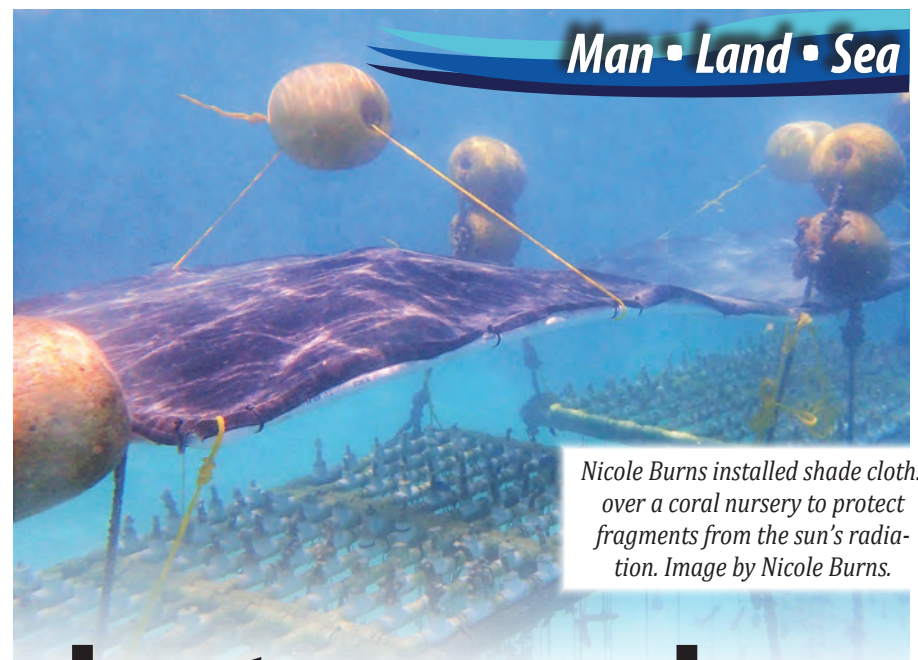
A young group of UOG students have volunteered to adopt native trees along Chalan Layon in Inarajan. President Richard Celeste and assisting Secretary Salve Jardeleza met with Ugum Watershed coordinator to learn more about the developing Adopt-A-Native-Tree program. Quarterly weeding and maintenance of the trees are expected.

For more information call GEPA at 300-4787.





Volunteers Marybelle Quinata and Joyce Merino help secure coral fragments to stakes in the seabed for Nicole Burns' coral outplanting. Image by Nicole Burns.



Nicole Burns installed shade cloths over a coral nursery to protect fragments from the sun's radiation. Image by Nicole Burns.

UOG Sea Grant student researchers make science accessible and fun

By Marie Auyong,
Extension Educator
University of
Guam Sea Grant

When some people think “scientist,” they imagine someone in a white lab coat, hunched over a microscope.

For others, a scientist is someone trudging through mud, counting species and using meters to measure stream flow.

Scientists frequently acquire at least two kinds of training: “bench,” or laboratory experience, and “field,” which could mean gathering data outside (or in the case of

Sea Grant, in water).

But University of Guam Sea Grant (UOGSG) Fellows gain another experience: specifically, that which requires them to share what they learn with the general public.

Since 2014, UOGSG has funded nine research projects managed by graduate students so they can

collect and analyze data for their final theses. Fellows must also design an outreach activity as part of their projects.

Four 2016 Sea Grant Fellows engaged with more than 400 community members in schools, museums, and habitats transformed into outdoor classrooms.



Participants examine an otolith under a microscope with help from intern Marcel Jardeleza at the “Day in the Life of a Marine Biologist.” Image by Valeri Lapacek.



Sean Moran gave several talks over his year about asuli (freshwater eels) and other fish; here he is with campers at the National Park Service River Rangers program. Image by Sean Moran.

Guam Agriculture partners with local artist to recover native birds

The Guam Department of Agriculture's Division of Aquatic and Wildlife Resources brown treesnake control awareness program, Kontra I Kulepbla (KIK) – Challenge the Snake, has partnered with Joshua Agerstrand to create native bird wall murals in Piti and Yigo. The murals will depict the yayaguak (Mariana swiftlet) in Piti and the sãli (Micronesian starling) in Yigo. The yayaguak in Piti will be a featured artist wall mural by Agerstrand and the sãli will be a community wall mural completed by the artist with the assistance of Island Girl Power.

The inspiration for creating more native bird wall murals came from the two murals painted in 2016 by New Zealand artists, Charles and Janine Williams, during the Festival of the Pacific Arts. The murals featured two Guam endemic birds, the ko'ko' (Guam rail) and the sihek (Micronesian kingfisher), two species which were almost driven to extinction by the invasive brown treesnake. Until brown treesnakes can be suppressed on Guam, native bird murals will provide an opportunity to maintain the memories of native birds within

Guam's culture and heritage.

A wall mural dedication event, "KIK Café to Go", will be held by invitation only at the Latte of Freedom to increase the conversation regarding snake control on Guam. Campaign target audiences will discuss topics from understanding about the USDA Automated Aerial Bait Delivery System to DAWR's captive bird breeding program.

Funding for the project comes from the U.S. Office of Insular Affairs in which the project coordination was contracted under Local Girl who was able to assist the artist and organize the event.

"KIK" it with us!

Visit the murals! Blog about the mural at <https://kikitwithus.wordpress.com/>

Let us know how you will support snake suppression on Guam!

#KontreIKulepbla
#Challengethesnake

For more information about the project call Jane Dia at 735-0281.

View other artwork by Joshua Agerstrand, Director of the Guam Art Exhibit, at @joshuabarrigada on Instagram.

Contact Local Girl, MJ Quenga, owner at 689-2296, Localgirl-guamsales@gmail.com

Calling all 3rd and 4th graders for the River Ranger Program!

In April, War in the Pacific National Historical Park, along with nonprofit partner Pacific Historic Parks, will host the River Ranger Program. This free, dynamic program teaches river ecology to children in 3rd and 4th grades. Through demonstrations, interactive activities, lively group discussions, and personal interactions with river plants and wildlife, youths are encouraged to look closer at their relationship with the environment and build upon their knowledge of the natural world. The program provides a fun way to learn about the plants and animals that are part of a river ecosystem and helps youth understand what they can do to protect them.

There are three Saturday morning sessions to choose from; April 7, 21 or 28, 2018. Applicants may choose one session. Each session provides educational activities about Guam's rivers, the special

value they hold, and how to help protect them.

Activities require hands-on exploring of the riverbanks and the plants and animals that live there.

Be a part of this exciting free educational program that encourages youths to tune their senses into the awesome river world at their national park!

Applicants must register at the T. Stell Newman Visitor Center in advance. The visitor center is located on Marine Corps Drive, near US Naval Base Guam and is open daily from 9am to 4:30pm. Find out more about the park by visiting <http://www.nps.gov/wapa>.

For more information on the River Ranger program email educationspecialist@pacifichistoricparks.org or contact the Education Program Coordinator, Tanya Sortor at 671-482-1234. Space is limited so register soon!



War in the Pacific National Historical Park

2018 River Rangers



Open to students in 3rd & 4th grade.
Three Saturdays to choose from: April 7, 21 or 28

For more information on how to register visit the T. Stell Newman Visitor Center located outside Naval Base Guam main gate (open daily 9:00 am – 4:30 pm), check out www.nps.gov/wapa, email educationspecialist@pacifichistoricparks.org or call 671-482-1234